

What supporting information do I need for my application to take groundwater?

- Aquifer testing

A critical assessment of environmental effects (AEE) is required for every resource consent application¹, including those to take and use groundwater. This document is intended to provide guidance to resource consent applicants in determining the level of hydrogeological information required in support of their AEE. As the scale and significance of groundwater takes increases beyond those 'permitted' under the PNRRP, the need for more supporting hydrogeological information increases. For some applications, site-specific aquifer testing may not be needed, as the level of supporting hydrogeological information (and other relevant information) is adequate to complete a critical AEE. However, in those instances, a clear justification for estimates of aquifer parameter values, aquifer type, and modelling assumptions will still be required to satisfy confidence in predicted environmental effects. An example of this justification would likely include analytical modelling of effects using appropriate sensitivity analysis.

For guidance on what level of hydrogeological information will be required to support an AEE, a 'Principles for exemption' list has been developed by Environment Canterbury. This list provides details of situations where an aquifer test will not be required to support an application. This list should be considered in context of Table 1 and Figure 1. The 'Principles for exemption' list will be expanded over time, to reflect case-by-case circumstances where Environment Canterbury's requirements can be satisfied without site-specific aquifer test data.

Keep in mind that the applicability of any exemption is determined by the purpose(s) for which an aquifer test is expected to serve. In the context of applications for groundwater take permits these include:

- confirmation that a well is able to yield the rates being applied for;
- determination of well interference effects;
- determination of stream depletion effects.

¹ Under Part 6 of the RMA, Section 88 requires that applications be accompanied by an Assessment of Environmental Effects (AEE) at a level of detail that "*corresponds with the scale and significance of the effects that the activity may have on the environment.*"

Schedule 4 states, in more detail, what an AEE must contain. This includes: "*an assessment of the actual or potential effect on the environment of the proposed activity*".

Principles for exemption

Testing requirements & exemptions as at October 2009:

1. Step testing² is to be undertaken in all cases unless a reliable step test has been carried out in the last 15 years.
2. Aquifer testing, with observation wells, is required unless:
 - there are no neighbouring wells within 2 km of the abstraction well, and there is no potential for direct stream depletion³;
 - the transmissivity calculations from the step test are used in conjunction with the Theis (1935) drawdown model in a WQN10 assessment, and there is no potential for direct stream depletion;
 - written approvals are provided for all wells within 2 km, and there is no potential for direct stream depletion;
 - an aquifer test with observation wells has been carried out in the same aquifer, within 500 m of the proposed abstraction location, the results from which are considered by Environment Canterbury to be reliable;
 - the well has been used as an observation well in an aquifer test and a corrected drawdown greater than 0.2 m was observed in this well.
 - the application is for a renewal with no change to pumping rates, or significant well location changes

Where the results from any aquifer testing are uncertain e.g. no response in observation bores, the interpretation and application these test results should be discussed with Environment Canterbury groundwater staff and will be considered case by case.

² A step test will: confirm well yield, both short term and long term; provide a measure of well efficiency; and, give a conservative (low) estimate of transmissivity.

³ To be exempt from a stream depletion assessment a well must be screened deeper than 50 m and/or be located more than 3 km from any surface water body.

Type of consent	Potential Effects	Test required
Replacement (No well-interference assessment required under PNRRP) (No location change)	Stream depletion Allocation: Rate of take should not exceed rate being yielded from the bore	Aquifer test with observation wells ¹
	No stream depletion	Step test to confirm yield ²
Change of conditions – deepening bore	Allocation: Rate of take should not exceed rate being yielded from the bore No stream depletion	Step test to confirm yield ² Aquifer test with observation wells to generate WQN10 parameters ³
	Stream depletion	Aquifer test with observation wells ¹
Change of conditions – Location change	Allocation: Rate of take should not exceed rate being yielded from the bore	Step test to confirm yield ² Aquifer test with observation wells to generate WQN10 parameters ³
	Stream depletion	Aquifer test with observation wells ¹
Change of condition –New bore	Well-interference (no stream depletion)	Step test to confirm yield Aquifer test with observation wells to generate WQN10 parameters ³
	Stream depletion	Aquifer test with observation wells ¹
Transfer site to site (new location)	Well-interference (no stream depletion)	Step test to confirm yield Aquifer test with observation wells to generate WQN10 parameters ³
	Stream depletion	Aquifer test with observation wells ¹
New application	Well-interference; no stream depletion; cumulative effect (effect on allocation block); Allocation: Rate of take should not exceed rate being yielded from the bore	Step test to confirm yield Aquifer test with observation wells to generate WQN10 parameters ³
	Stream depletion;	Aquifer test with observation wells ¹

¹ Where a minimum flow condition is proposed, only a step test is required to confirm well yields.

² Step test not required, where a full step test has been carried out within the last 15 years,

³ Where justified, a well interference (WQN10) assessment using Theis (1935) on all wells is an accepted alternative to full aquifer testing. Estimate of transmissivity will be based on analysis of step test.

Decision path for aquifer test requirements at time of application

